

Customer No. 30223

PATENT  
47099-00135USPT

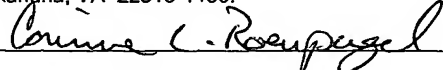
## APPLICATION FOR UNITED STATES LETTERS PATENT

for

## CUP HOLDER HAVING FRUSTO-CONICAL CAVITIES

by

Richard C. Sweeney

EXPRESS MAIL MAILING LABEL	
EXPRESS MAIL NO.:	EL 831726090 US
DATE OF DEPOSIT:	July 17, 2003
I hereby certify that this paper or fee is being deposited with the United States Postal Service "EXPRESS MAIL POST OFFICE TO ADDRESSEE" service under 37 C.F.R. 1.10 on the date indicated above and is addressed to: Mail Stop Patent Application, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.	
Signature:	

## **CUP HOLDER HAVING FRUSTO-CONICAL CAVITIES**

### **FIELD OF THE INVENTION**

The present invention is directed generally to cupholders and more specifically to  
5 cupholders having frusto-conical cavities for holding cups.

### **BACKGROUND OF THE INVENTION**

Platforms for holding cups are commonly used at sporting events, theaters,  
restaurants, and the like, for enabling a user to conveniently and easily hold multiple  
10 containers, such as cups or other beverage containers, with stability. It is preferable for  
cupholders to be easily held with one hand, and to provide a strong grip for containers  
placed within cavities disposed around the cupholder. It is further preferable for a  
cupholder to retain a significant amount of stability against tipping when the cupholder  
holds containers filled with beverages.

15 Prior cupholders have used a variety of cupholding formations within holder  
cavities, with varying degrees of success. There still exists a concern that cupholders for  
carrying multiple containers, or for carrying different types of containers, are not  
sufficiently sturdy and do not sufficiently grip beverage containers to provide adequate  
stability. There exists a need for an improved cupholder design which securely holds  
20 cups, is sturdy enough to hold a number of cups with one hand, counters tipping  
problems, and releases cups easily when needed. The present invention addresses this  
need.

### **SUMMARY OF THE INVENTION**

25 According to one embodiment of the present invention, a cupholder is provided  
with a plurality of holding extensions adapted to grip containers inserted within cavities  
of the cupholder.

Cupholders according to the present invention may be provided with gripping  
flanges extending inwardly toward centers of cavities from holding extensions and  
30 adapted to exert a frictional force against side walls of containers inserted into the  
cavities.

The gripping flanges may have inner and outer facets meeting at facet interfaces that directly contact outer walls of containers inserted into the cupholder cavities. The inner facets may meet at junction regions that impart greater stability to the gripping flanges and increase holding force.

5 Further, gripping points may be provided at lower edges of the gripping flanges for gripping containers inserted into the cavities. The gripping flanges may provide force pushing a container inwardly such that a bottom rim provided on a container is pushed toward a raised portion of a cavity base.

10 The above summary of the present invention is not intended to represent each embodiment, or every aspect, of the present invention. This is the purpose of the figures and the detailed description which follow.

### BRIEF DESCRIPTION OF THE DRAWINGS

15 The foregoing and other advantages of the invention will become apparent upon reading the following detailed description and upon reference to the drawings, in which:

FIG. 1 is a perspective view of a cupholder;

FIG. 2 is a top view of a cupholder cavity;

FIG. 3 is a cross-sectional view along the line 3-3 of FIG. 2.

20 While the invention is susceptible to various modifications and alternative forms, specific embodiments have been shown by way of example in the drawings and will be described in detail herein. It should be understood, however, that the invention is not intended to be limited to the particular forms disclosed. Rather, the invention is to cover all modifications, equivalents, and alternatives falling within the spirit and scope of the invention as defined by the appended claims.

### DESCRIPTION OF ILLUSTRATIVE EMBODIMENTS

25 The present invention is directed to a cupholder designed for reliable gripping of beverage containers and exceptional sturdiness. FIG. 1 shows a cupholder 10 according to one embodiment of the present invention. The cupholder 10 of the embodiment shown in FIG. 1 has four cavities 12 adapted for holding containers such as cups, glasses, food cartons, and the like, which are generally cylindrical or tapering from an opening to

30

a base. It is to be understood that while a four-cavity cupholder 10 is shown for illustrative purposes, the present invention applies to cupholders having more or fewer cavities as required in specific applications.

5 Cupholders according to the present invention are preferably formed of molded fiber. However, the principles of the present invention may be applied to cupholders formed of thermoformed plastics or foams and other construction materials as known in the packaging art.

Each cavity 12 of the cupholder 10 is formed in a generally frusto-conical shape, tapering from a widest point at a cavity mouth 14 to a narrowest point at a cavity base 16. 10 According to one embodiment of the present invention, each cavity 12 is provided with first, second, and third holding extensions 18, 20, and 22, with each of the side wall members terminating along their sides at first and second gripping flanges 24 and 26. As will be explained in more detail below, the gripping flanges 24 and 26 are formed to extend inwardly toward a center of each cavity 12, thereby gripping cups or other 15 containers as they are inserted into the cavities.

Between the holding extensions 18, 20, and 22, each of the cavities 12 has outwardly-curved walls 28 having a curvature corresponding to the curvature of a cone having as its base a circle having the radius of a cavity mouth 14 and as its vertex the vertex of a cone encompassing the cavity mouth 14 as its base and a cavity base 16 as a 20 cross-sectional circle. Thus, in the orientation shown in FIG. 1, each of the cavities 12 has side wall members 18, 20, and 22 each forming a generally frusto-conical shape, with the cone extending inwardly into the page. The cupholder 10 may be provided with a strengthening downturned rim 30 to increase the sturdiness of the cupholder 10 and also to allow easy gripping of the cupholder 10 by a user.

25 The gripping flanges 24 and 26 serve to grip cups or other inserted containers via frictional force against the container's outer walls. Each of the gripping flanges terminates at an inwardly-extending gripping points 32 and 34. The gripping points 32 and 34 extend at acute angles from lower ends of the gripping flanges 24 and 26 and point toward each other such that a force is exerted between the gripping points and the 30 outer walls of an inserted container, in addition to the force exerted by the gripping flanges 24 and 26 of each of the holding extensions 18, 20, and 22 toward the center of

the container. The combined frictional force of the gripping points 32 and 34 and the gripping flanges 24 and 26 holds inserted containers in a stable insertion position.

Turning now to FIG. 2, a top view of a cavity 12 more clearly shows the structure of the gripping flanges 24 and 26 of the holding extensions 18, 20, and 22. The gripping flanges 24 and 26 meet along a top edge at a junction region 35, and extend downwardly away from each other until they approach each other once again at the gripping points 32 and 34 located along the lower edges of each of the gripping flanges.

The gripping flanges include two facets: inner facets 36 and outer facets 38. The inner facets 36 and the outer facets 38 meet at a facet interface 40 that extends along both gripping flanges 24 and 26 including the junction region 35. According to one embodiment, the junction region 35 is the meeting point of the inner facets 36 of the first and second gripping flanges 24 and 26, and it adds additional strength to the gripping flanges 24 and 26 tending to keep them from splaying excessively during use. The facet interface 40 is biased against a container inserted into the cavity 12, holding the cup in place. The tendency of the material of the cupholder 10 to maintain its original shape provides frictional force holding an inserted container in place. A bottom end of each of the holding extensions 18, 20, and 22 terminates in a cut-out area 42 that allows the gripping flanges 24 and 26 to move outwardly when a container is inserted into a cavity 12, allowing the cavity to hold different sizes of inserted containers.

The cavity base 16 is provided with a raised portion 44 that provides support when cups having bottom ridges are placed within the cavity 12. The cavity 12 of FIG. 2 is shown with three holding extensions 18, 20, and 22, though it is to be understood that cupholder cavities having more or fewer holding extensions are contemplated.

Turning now to FIG. 3, a cross-sectional view along the line 3-3 of FIG. 2 shows the structures of a holding extension 18 more directly. The inner facets 36 and outer facets 38 of the gripping flanges 24 and 26 can be seen meeting at the facet interface 40. The first and second gripping points 32 and 34 can be seen extending inwardly from the gripping flanges 24 and 26. The junction region 35 joins the upper portions of the gripping flanges 24 and 26. According to one embodiment of the present invention, the junction regions 35 are parabolic in shape.

Cupholders according to the present invention extend the cup-contacting region between the gripping flanges 24 and 26 and a cup beyond the cup-contacting region of traditional cupholders. For example, according to some embodiments of the invention the gripping flanges 24 and 26 may contact a cup along a two-inch vertical area, while traditional cupholders have smaller cup-contacting regions of between an eighth and a quarter of an inch. The increased contact between the cup and cupholder structures increases the stability of cups held within the holder. Further, the impact of any areas where contact does not occur between the gripping flanges 24 and 26 and an inserted cup (for example, through bending or other deformation of the cupholder) is lessened because there are other areas of contact that make up for lost segments of contact.

The raised portion 44 of the cavity base 16 is also visible, with a cup rim gripping region 46 visible between the raised portion 44 of the cavity base 16 and the gripping flanges 24 and 26. Cups such as paper cups are commonly provided with lower rims or lips elevating a cup base from a surface on which a cup is placed. Thus, the gripping flanges 24 and 26 tend to push a cup outwardly from the page as shown in FIG. 3 so that the lower cup rim is pushed toward rim support regions 48 of the raised portion 44 of the cavity base 16.

It is to be understood that cupholders according to the present invention may be made in a variety of sizes with components having a variety of different dimensions. According to one embodiment of the present invention, cupholder cavities 12 are provided with cavity mouths having a diameter of approximately 3.5 inches and cavity bases having a diameter of approximately 2.25 inches.

While the present invention has been described with reference to one or more particular embodiments, those skilled in the art will recognize that many changes may be made thereto without departing from the spirit and scope of the present invention. Each of these embodiments and obvious variations thereof is contemplated as falling within the spirit and scope of the claimed invention, which is set forth in the following claims.